

EURACE Project Description



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Project full title: “An agent-based software platform for European economic policy design with heterogeneous interacting agents: new insights from a bottom up approach to economic modeling and simulation.”

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1 Project Summary

Macroeconomic policy design plays a fundamental role in social welfare and requires a coordinated application of economic policy measures, e.g., fiscal and monetary strategies, knowledge exchange, R&D incentives etc.. Generally speaking, the interplay of such different measures is not completely understood and macroeconomic design follows a classical approach. Conversely, there is considerable interest in the development of an alternative paradigm to the rational representative agent model.

This project tackles this complex problem and proposes an innovative approach to macroeconomic modelling and economic policy design within the agent-based computational economics framework. The project objectives are characterized by scientific, technological and societal scopes.

From the scientific point of view, the main effort regards the study and the development of multi-agent models that reproduce, at the aggregate economic level, the emergence of global features as a self-organized process from the complex pattern of interactions among heterogeneous individuals.

The following two major scientific objectives can thus be identified:

- **SO1. Establishing an innovative framework for the study of the macroeconomy according to the agent-based computational approach.**

- **SO2. Providing new insights on the emergence of global regularities in the aggregation of heterogeneous interacting agents.**

From the technological point of view, the project will develop, with advanced software engineering techniques, a software platform in order to realize a powerful environment for large-scale agent-based economic simulations. Key issues will be the definition of formal languages for modelling and for optimizing code generation, the development of scalable computational simulation tools and the standardization of data with easy to use human-machine interfaces.

The following two major technological objectives can thus be identified:

- **TO1. Development of new software methodologies for implementing, designing and validating large-scale agent-based economic simulations.**
- **TO2. Development of an agent-based software platform to perform simulation experiments on economic policy design for the European Union.**

From the social point of view, the agent-based software platform for the simulation of the European economy will have an outstanding impact on the economic policy design capabilities of the European Union. It will be a powerful tool, enabling to perform what-if analysis, optimizing the impact of regulatory decisions that will be quantitatively based on European economy scenarios.

2 Project partners

- Università degli Studi di Genova (UG) Italy (Coordinator)
- Universität Bielefeld (UNIBI) Germany
- Université de la Méditerranée (GREQAM) France
- National Research Institute of Electronics and Cryptology (TUBITAK/UEKAE) Turkey
- Università Politecnica della Marche (UPM) Italy
- University of Sheffield (USFD) UK
- Università degli Studi di Cagliari (UNICA) Italy
- Council for the Central Laboratory of the Research Councils (CCLRC) UK
- Columbia University, New York, US (Affiliate Member)